

## THE REDISCOVERY AND NATURAL HISTORY OF THE WHITE-MASKED ANTBIRD (*PITHYS CASTANEUS*)

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**ABSTRACT.**—In July 2001, a Louisiana State University Museum of Natural Science expedition rediscovered the White-masked Antbird (*Pithys castaneus*) at a site along the Río Morona in northwestern Departamento Loreto, Peru. Prior to this rediscovery, the species was known only from the type specimen, taken in 1937, and nothing was recorded concerning its natural history. The lack of additional specimens led to speculation that *P. castaneus* was a hybrid. Here, we present data demonstrating that the White-masked Antbird is a valid species, and we report the first observations of its behavior, habitat, morphology, and voice. Received 14 January 2005, accepted 11 October 2005.

In 1938, Berlioz (1938) described a distinctive new species of antbird in the genus *Pithys*—until then considered monotypic—from a single specimen collected by Ramon Olalla on 16 September 1937 at “Andoas, lower [Río] Pastaza, eastern Ecuador.” This new species, the White-masked Antbird (*Pithys castaneus*), has remained one of the most intriguing mysteries of Neotropical ornithology for over 60 years (see David and Gosselin 2002 for gender of scientific name). Besides the collector, no biologist had ever seen the bird alive, and there is no information on the species’ natural history or preferred habitat. The type locality, “Andoas,” is particularly intriguing in that at least three sites in the Pastaza area bear this name (Stevens and Traylor 1983, Paynter 1993), and according to T. Mark (*in litt.*), we may never really know the true location of the type locality.

The type specimen, a male (contra Ridgely and Tudor 1994), is housed at the Paris Museum in France. According to Berlioz (1938, 1948), it was part of a collection that included three specimens of White-plumed Antbird (*P. albifrons peruvianus*) and therefore appeared

to be a sympatric congener. It differed from *P. albifrons* in its larger size, its lack of any gray on the body, and its lack of elongated plumes on the face or throat.

Decades passed without any additional records of *P. castaneus*. Subsequent authors doubted the validity of the species, and many suggested that it represented nothing more than a hybrid of *P. albifrons* and another antbird species (Sibley and Monroe 1990, Schulenberg and Stotz 1991, Collar et al. 1992, Stattersfield and Capper 2000, Ridgely and Greenfield 2001b). Willis (1984) and personnel at the Philadelphia Academy of Natural Sciences (ANSP: Collar et al. 1992, Ridgely and Tudor 1994) searched without success for *P. castaneus* along the upper Río Pastaza in Peru and Ecuador, respectively.

Thus, when our Louisiana State University Museum of Natural Science (LSUMZ) ornithological field team visited several sites in northwestern Departamento Loreto, Peru, from May through July 2001, it was with great surprise that we found *P. castaneus* to be fairly common at one of our field sites. The main goal of our fieldwork was to inventory the avifauna of two isolated patches of *varillal* (white sand) forest (see Whitney and Alvarez 1998; Alvarez and Whitney 2001, 2003). One of these forest patches was in the interfluvium between the Morona and Santiago rivers in northern Peru, north of the Río Marañón, only about 60 km west of the Río Pastaza, and it was there that we found *P. castaneus*.

Remarkably, while reviewing specimen material at the Museo de Historia Natural de la Universidad Mayor San Marcos (MUSM),

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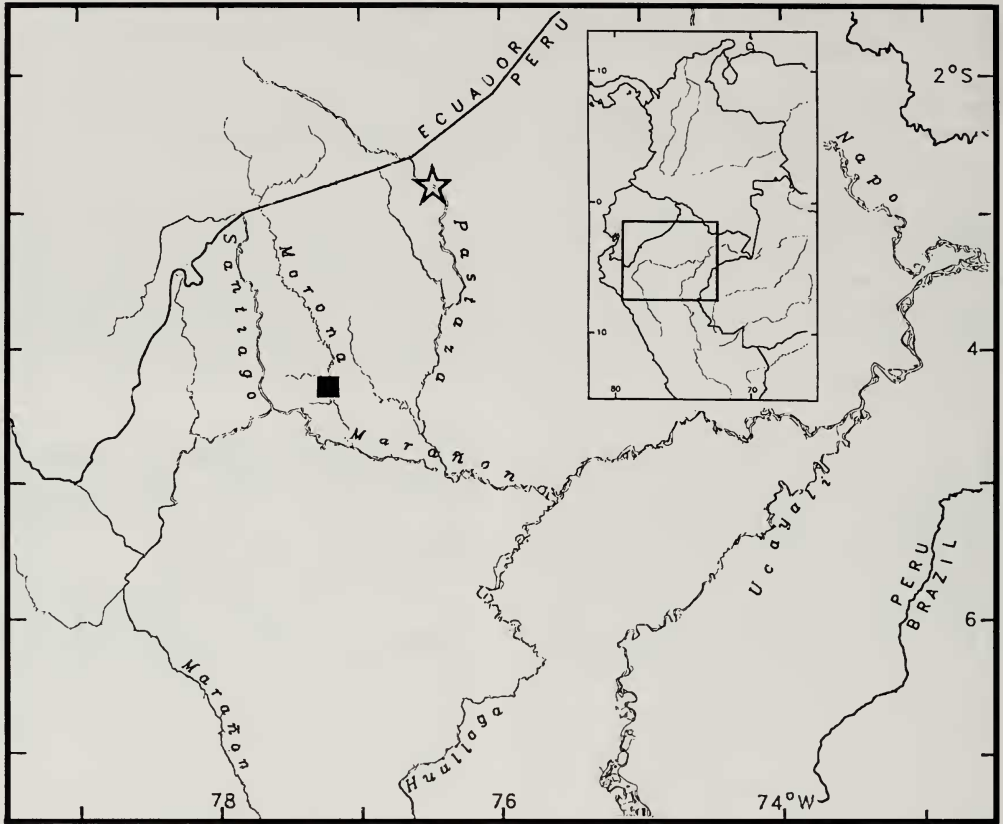


FIG. 1. Known localities for *Pithys castaneus* in northwestern Departamento Loreto, Peru. The star represents suspected location of "Andoas," the type locality, on the Río Pastaza (Berlioz 1938). The square represents the location of the species' rediscovery in July 2001 on the west bank of the Río Morona ( $04^{\circ} 17' S$ ,  $77^{\circ} 14' W$ ). The Cordillera Campanquís lies between the ríos Morona and Santiago, immediately to the west of our field site.

Lima, in November 2002, we discovered two additional specimens of *P. castaneus* (one adult and one juvenile). These specimens were reportedly taken somewhere in the Cordillera Campanquís region on the border of Departments Amazonas and Loreto between the Morona and Santiago rivers (see Fig. 1), in the mid- to late 1990s by a Peruvian anthropologist, Andres Treneman (I. Franke J. pers. comm.). Unfortunately, no additional specimen data are available, and the collector could not be contacted for additional information.

#### METHODS

*Locality.*—We established a campsite on the west bank of the Río Morona about 54 km north-northwest of its mouth ( $04^{\circ} 17' S$ ,  $77^{\circ} 14' W$ ; Fig. 1), Departamento Loreto. The

study site was on the south side of the mouth of Quebrada Cashacaño, a right-bank tributary of the Río Morona, about 2.3 km north of the village of Tierra Blanca. We observed and made a general collection of birds at this site between 2 and 21 July 2001. Our camp was set up in a clearing of a homestead abandoned about 30 years earlier and which, reportedly, has been reinhabited since our visit (B. Walker pers. comm.). A preexisting trail, used for the harvest of palm fronds for thatched-roof construction, led directly into white-sand forests for about 2 km. Another trail, cut along the bluff above the Morona, connected the camp with the village of Tierra Blanca. From this trail, at least another three trails also entered the *varillal* forest. Additional trails were cut near camp for census routes and net lanes;

most trails were in *varillal*, but three also entered the adjacent *varzea* (seasonally inundated) forest. We also found two patches of richer clay-soil *terra firme* forest north and south of the surveyed *varillal* forest patch, into which we cut two trails.

*Habitat*.—Most of the forest where *P. castaneus* was observed—particularly away from major water bodies—grew on very moist, white-sand soils. Numerous areas of wet, swampy conditions indicated a high water table. The terrain was without significant relief, but throughout the *varillal* forest were many small depressions where water accumulated (particularly after rains), presumably pits resulting from tree-falls. The soil consisted of rather coarse sand with stones of up to 5 cm in diameter (up to 15 cm in the small creeks that transected the forest interior). Using a natural cut at the Río Morona riverbank for reference, the sandy soil is approximately 4 m deep at the river's edge. Typical of many *varillal* forests, a thick layer of dead leaves and humus covered the forest floor (Ruokolainen and Tuomisto 1993, 1998; Richards 1996). The forest canopy of the *varillal* was relatively even, with a height of about 20 to 30 m. The relative absence of buttressed trees is typical of *varillal* forests (Richards 1996); however, many such trees were present in more humid forest areas at the Morona site. As has been noted in other *varillal* forests (Anderson 1981, Richards 1996), there were few lianas, and epiphytic growth was negligible.

*Data collection*.—We collected specimens using mist nets and shotguns. Permits for specimen collection were issued by Peru's Instituto Nacional de Recursos Naturales (INRENA). Specimens were deposited into the collections of LSUMZ and MUSM. Skull ossification, gonad information, and presence of fat in prepared specimens were determined following standard LSUMZ specimen preparation protocol. Natural history information was acquired through opportunistic (not systematic) encounters with *P. castaneus*. Spectrograms of voice recordings were prepared using Canary sound analysis software (Charif et al. 1995).

*Specimens examined*.—*Pithys castaneus*: Peru: Loreto; west bank of Río Morona, ~54 km NNW of the mouth, 140 m elevation (04° 17' S, 77° 14' W) (LSUMZ 172973, 172974,

172975, 172976 [skeleton and partial skin], 172977, 172978, 172979 [skeleton and partial skin], MUSM 23504, 23505, 23506, 23507; DFL 1646 [skeleton, uncataloged], TVH 399 [alcohol, uncataloged]).

*Pithys albifrons*: Ecuador: Pastaza; Cocomaco, 300 m elevation (LSUMZ 83237); Peru: Amazonas; Huampami, ~215 m elevation (LSUMZ 84917), Chiriaco, ~320 m elevation (LSUMZ 78514, 88018, 88019, 88022); Loreto; Libertad, S bank of Río Napo, 80 km N of Iquitos, 120 m elevation (LSUMZ 110094, 110096, 110097, 110098, 110099, 110100, 110102, 110103, 110104, 110105); 157 km by river NNE of Iquitos, N of Río Napo, 110 m elevation (LSUMZ 110106, 110109, 110112, 110113).

*Gymnopithys leucaspis*: Peru: Loreto; west bank of Río Morona, ~54 km NNW of the mouth, 140 m elevation (04° 17' S, 77° 14' W) (LSUMZ 172985); Quebrada Orán, ~5 km N of Río Amazonas, 85 km NE of Iquitos, 110 m elevation (LSUMZ 119884, 119885, 119886, 119887, 119890, 119891, 119892, 119893).

*Phlegopsis erythroptera*: Ecuador: Sucumbios; Limoncocha, 300 m elevation (00° 24' S, 76° 37' W) (LSUMZ 70916, 70917, 70919, 83314). Peru: Loreto; W bank of Río Morona, ~54 km NNW of the mouth, 140 m elevation (04° 17' S, 77° 14' W) (LSUMZ 173001); 1.5 km S of Libertad, S bank of Río Napo, 80 km N of Iquitos, 120 m elevation (LSUMZ 110213, 110215, 110217); 1 km N of Río Napo, 157 km by river NNE of Iquitos, 110 m elevation (LSUMZ 110219); lower Río Napo region, E bank of Río Yanayacu, ~90 km N of Iquitos, 120 m elevation (LSUMZ 115573).

*Rhegmatorhina melanosticta*: Peru: Amazonas; headwaters of Río Kagka (of Río Cenepa), ~790 m elevation (04° 16' S, 78° 09' W) (LSUMZ 88028, 88029); San Martín; ~15 km by trail NE of Jirillo on trail to Balsapuerto, 1,350 m elevation (LSUMZ 116947); Huanuco; ~35 km NE Tingo of María, Hacienda Santa Elena, ~1,000 m elevation (LSUMZ); Pasco; Abra Aguachini, ~30 km SW of Puerto Bermudez, 1,020 m elevation (LSUMZ 130274); Pasco; Puellas, km 41 on Villa Rica–Puerto Bermudez highway, 950 m elevation (LSUMZ 106073, 106074, 106078).

## RESULTS

*Specimen data.*—We collected 13 specimens of *Pithys castaneus* during our visit to the Río Morona site. We prepared nine as study skins (from which several trunk skeletons were saved), three as complete skeletons (from which two partial skin specimens were saved), and one was preserved whole in alcohol. Mass and lengths of flat-wing, tail, tarsus, and culmen (from distal edge of the nares to bill tip) of all specimens are presented and compared with measurements of the *P. castaneus* holotype and other Peruvian ant swarm-following antbirds (Table 1).

Three of the 12 specimens in “adult” plumage (LSUMZ 172973, MUSM 23504, MUSM 23507) still possessed a bursa of Fabricius and one had an incompletely ossified skull (75% ossification), suggesting that first basic plumage is acquired quickly and is nearly indistinguishable from definitive plumage (but see below). One specimen (LSUMZ 172978) was a male still largely in juvenal plumage (skull ossification 50%, bursa  $8 \times 6$  mm). Of the 12 specimens dissected, only 2—both with immature characters—were reported to have subcutaneous fat deposits: “trace fat” in one and “light fat” in the other. Six of 12 specimens dissected exhibited trace or light body molt. Seven individuals had asymmetrical wing molt, and seven had asymmetrical tail molt. Stomach contents were reported as “insect parts” for all specimens in which the stomachs were not empty. The guts of two specimens were infested with nematodes.

*Variation in the series.*—Twelve specimens—5 males and 7 females—exhibited similar plumage, with no sexual dichromatism. All these adults appeared to match the description of *P. castaneus* and the photos of the holotype very closely. Of the specimens in “adult” plumage, two that appeared to be in their first year (see above) have very sparse, light-grayish scaling on the center of the throat (unmarked white in all other individuals), suggesting that it may be an age-related character. Otherwise, plumage characters were uniform among all the “adult” specimens. The juvenal-plumaged bird differs in being washed with colder brown overall, particularly on the breast, vent, and center of the back. Furthermore, the white of the juvenile’s face

TABLE 1. Mean ( $\pm$  SD) measurements of specimens<sup>a</sup> of *Pithys castaneus*, *P. albifrons*, and associated species from Peru and Ecuador.

	<i>n</i>	Mass (g)	Flat wing (mm)	Tail (mm)	Tarsus (mm)	Culmen (mm)
<i>Pithys castaneus</i> (holotype) <sup>b</sup>	1	—	82	—	23	15
<i>Pithys castaneus</i> (Morona specimens-males)	6	29.6 $\pm$ 2.7	82.8 $\pm$ 2.0	52.2 $\pm$ 1.9	25.0 $\pm$ 0	12.0 $\pm$ 0.7
<i>Pithys castaneus</i> (Morona specimens-females)	5	30.1 $\pm$ 1.5	80.6 $\pm$ 1.7	52.3 $\pm$ 2.9	24.4 $\pm$ 0.5	12.0 $\pm$ 1.2
<i>Pithys albifrons</i> (males)	10	18.7 $\pm$ 2.4	67.5 $\pm$ 2.0	36.4 $\pm$ 1.5	22.2 $\pm$ 0.7	10.9 $\pm$ 0.4
<i>Pithys albifrons</i> (females)	10	18.5 $\pm$ 1.3	65.5 $\pm$ 1.5	35.6 $\pm$ 1.1	21.5 $\pm$ 0.8	10.6 $\pm$ 0.4
<i>Gymnophithys leucaspis</i> (males)	5	23.9 $\pm$ 2.7	73.5 $\pm$ 2.3	43.9 $\pm$ 0.9	26.0 $\pm$ 0.5	11.8 $\pm$ 0.4
<i>Gymnophithys leucaspis</i> (females)	5	23.8 $\pm$ 2.3	71.9 $\pm$ 1.3	42.9 $\pm$ 2.1	25.8 $\pm$ 1.2	11.0 $\pm$ 0.6
<i>Phlegopsis erythroptera</i> (males)	5	58.4 $\pm$ 5.2	91.6 $\pm$ 1.7	63.3 $\pm$ 2.4	33.5 $\pm$ 1.7	12.9 $\pm$ 0.6
<i>Phlegopsis erythroptera</i> (females)	5	58.2 $\pm$ 7.0	88.0 $\pm$ 1.3	59.0 $\pm$ 1.0	32.0 $\pm$ 1.4	12.0 $\pm$ 0.5
<i>Rhegmatiorhina melanosticta</i> (males)	4	30.0 $\pm$ 1.9	81.3 $\pm$ 5.2	53.0 $\pm$ 2.0	27.6 $\pm$ 1.2	12.4 $\pm$ 0.3
<i>Rhegmatiorhina melanosticta</i> (females)	5	33.0 $\pm$ 4.7	78.0 $\pm$ 2.8	49.8 $\pm$ 2.5	27.4 $\pm$ 0.8	11.7 $\pm$ 0.6

<sup>a</sup> See section on *Specimens examined* for catalog numbers and localities of specimens.<sup>b</sup> Measurements of the holotype are taken from Berlioz (1938), and are likely not to have been measured in the same way as the other specimens included here.

TABLE 2. Number of individuals per species attending army ant swarms (*Eciton burchelli* and *Labidus praedator*) with *Pithys castaneus*, Departamento Loreto, Peru, July 2001. Columns represent individual swarms. Only swarms observed for >15 min were included.

	Date (ant swarm <sup>a</sup> )								
	4 July (E)	6 July (E)	6 July (E)	8 July (E)	10 July (L)	11 July (E)	12 July (E)	14 July (L)	17 July (E)
<i>Pithys castaneus</i>	2	4	3	3	1	1	4	4	3
<i>Pithys albifrons</i>	3	5	—	—	—	—	—	—	—
<i>Phlegopsis erythroptera</i>	—	2	—	—	—	—	—	—	—
<i>Gymnopithys leucaspis</i>	5	4	2	2	—	3	2	4	4
<i>Hylophylax poecilinota</i>	—	2	2	1	1	—	—	—	—
<i>Percnostola arenarum</i>	1	—	1	—	—	—	1	1	2
<i>Dendrocolaptes certhia</i>	1	3	—	—	—	—	—	—	—
<i>Dendrocincla merula</i>	—	—	—	—	—	—	—	1	1
<i>Xiphorhynchus ocellatus</i>	2	2	—	—	—	1	—	1	1
<i>Deconychura longicauda</i>	1	—	—	—	—	—	—	—	—

<sup>a</sup>E = *Eciton burchelli*, L = *Labidus praedator*.

was restricted to the area between the eye and gape and a longitudinal line along the center of the throat. This specimen's dark head markings were more extensive than those on definitive-plumaged birds, and they were a duller, sooty, dark brown (see frontispiece).

Soft-part colors were relatively uniform across most specimens. The irides were brown or dark brown (all soft-part colors taken from tag data recorded at time of preparation) in nine specimens with adult characters, dark gray-brown in the three specimens with first-basic characters, and dark gray in the juvenile. Thus, iris color evidently changes from gray to dark brown as an individual ages. In all specimens, the maxilla was blackish-slate with a silvery-white tomium, the latter constricted at mid-bill in some individuals. Mandible coloration varied more. Most adults had a mostly silvery-white tomium with blackish-slate color on the gonys and base of the mandible (except the tomium). Approximately the distal half of the juvenile's bill was silvery-white, and the mouth interior was dark gray. The tarsus color of adult individuals was brownish-orange or ochre-orange; the juvenile's tarsi were dirty yellow with a gray tinge. The toes were dirty yellow, pale orange, or dull saffron yellow; the claws of the juvenile bird were gray.

**Behavioral observations.**—Our initial observations of *P. castaneus* were made by TVH and DFL at a swarm of *Eciton burchelli* army ants on 4 July 2001, when the first specimens were collected. Based on our observations, we

were confident in labeling *P. castaneus* a professional army ant-follower (*sensu* Willis 1967). We never saw it foraging away from army ant swarms and observed it attending swarms of two army ant species: *Eciton burchelli* and *Labidus praedator*. For at least 12–15 min on 8 July, JAA observed a single individual of *P. castaneus* with a female Scale-backed Antbird (*Hylophylax poecilinota*) following a swarm of *L. praedator* ants that occupied less than 10 m<sup>2</sup> of the forest floor. The bird's behavior was similar to that of others observed following swarms of *E. burchelli*. Both the *P. castaneus* and the *H. poecilinota* individuals left the swarm for 3–4 min, only to return later. Also observed attending swarms of *L. praedator* (although independent of the above observation) were Allpahuayo Antbirds (*Percnostola arenarum*), a species previously unknown as an ant-follower (Isler et al. 2001, Zimmer and Isler 2003), and Bicolored Antbirds (*Gymnopithys leucaspis*). On four occasions on different days, we observed a single individual of *P. castaneus* quietly passing through the forest without foraging, suggesting movement between ant swarms or between an ant swarm and a nest (Willis 1981). In Table 2, we present the attendance of regular ant-following species observed at swarms at the Morona site.

Most often, *P. castaneus* was observed at or near the broad front of a moving ant column. Individuals tended to perch  $\leq 0.5$  m above ground and frequently dropped to the forest floor to investigate leaf litter or capture

arthropods. Birds often were observed attending a swarm for 5 to 15 min at a time and then leaving the swarm (at least once while carrying a food item) for roughly equal periods of time. On at least one such occasion, a pair of *P. castaneus* was observed joining a family group of *G. leucaspis* moving between what appeared to be two column heads (about 30 m apart) of a single *E. burchelli* ant swarm. Willis (1981) reported similar behavior for *P. albifrons*. On another occasion, a single individual was seen moving around a standing hollow tree in which a swarm of *E. burchelli* had bivouacked the previous evening, but had not yet started its morning activity.

Most of the professional ant-following thamnophilids at the Morona site regularly made exaggerated tail “pounding” or “wagging” movements (terms following Zimmer and Isler 2003) while foraging at ant swarms, especially upon returning to a perch after pouncing on a prey item, or when agitated by the presence of an observer. *P. castaneus* was not observed regularly using any such tail movement. Only once or twice did we notice an individual pound its tail, usually after a pouncing attack on prey; the tail movement was made once and not repeated. By contrast, DFL noted that the *G. leucaspis* almost constantly wagged their tails laterally, although this contrasts with the published observations of others (e.g., Zimmer and Isler 2003). In addition, DFL observed both *P. albifrons* and the Reddish-winged Bare-eye (*Phlegopsis erythroptera*) regularly pounding their tails downward (also see Willis 1981, 1984; Zimmer and Isler 2003). We were unable to determine whether such tail movements are intended as a form of inter- or intraspecific “body language” among swarm attendants, as a sign of agitation, or as a form of flushing insect prey. Nevertheless, the relative lack of such tail-moving behavior in *P. castaneus* seems noteworthy. Willis (1968) reports that the monotypic genus *Skutchia* also lacks stereotypic tail-moving behavior, but other observers contest this (B. M. Whitney pers. comm.).

In our observations of ant-following birds at the Morona site (Table 2), we noted several occurrences of one ant-following species supplanting another near the leading edges of ant swarms and took this to represent a domi-

nance hierarchy among the attendant species (see Willis 1967, 1981). From our observations, we concluded that the dominance hierarchy (from most to least dominant) was *Phlegopsis erythroptera*, *Pithys castaneus*, and *G. leucaspis*. Other swarm-attending antbirds, including *Pithys albifrons*, noticeably avoided the leading edge of the swarm when any of the other professional ant-followers were present. Our observations of the last species agree with those of Willis (1981), who also termed *P. albifrons* a subordinate ant swarm attendant. Since the dominance hierarchy suggested above has a positive correlation to overall body size, we suggest that size may be the ultimate cause (or, alternatively, a proximate cause—i.e., a source of maintenance) of the hierarchy (see Table 1).

*Voice*.—We recorded at least seven distinct vocalizations from *P. castaneus* (Fig. 2), including a mewed whistle that rises in frequency (Fig. 2A). This is a single note often given quietly, although occasionally it can be quite loud, and we suspect represents the species’ “loudsong” (such as it is). To our knowledge, *P. albifrons* does not give a true loudsong (*sensu* Willis 1967, Isler et al. 1998, Isler and Whitney 2002, Zimmer and Isler 2003) as do most other thamnophilids. However, the species is known to produce a vocalization similar to that described above for *P. castaneus*: a rarely heard, weak, mewing whistled vocalization that falls in frequency and is suspected to serve as a song (Willis 1981, Isler and Whitney 2002; Fig. 2B). The whistled notes of the loudsong of *P. castaneus* appear to be punctuated by occasional quiet, chiming notes (Fig. 2C), perhaps an integral part of the loudsong. Song intervals can be as short as 2 sec but often are longer.

*P. castaneus* also produced two vocalizations when alarmed or when agitated by playback of what we believed was the species’ song (see below). These notes of agitation were interspersed with sharp chattered “chit!” calls (Fig. 2D), similar to the “chip” calls described for *P. albifrons* by Willis (1981). Another vocalization given by agitated birds was a louder, higher-pitched “chirr,” with the individual notes more distinct (Fig. 2E) than in the undisturbed chirr call (see below). Occasionally, the agitated chirr commenced with a chit note (Fig. 2F). While giving these vocal-

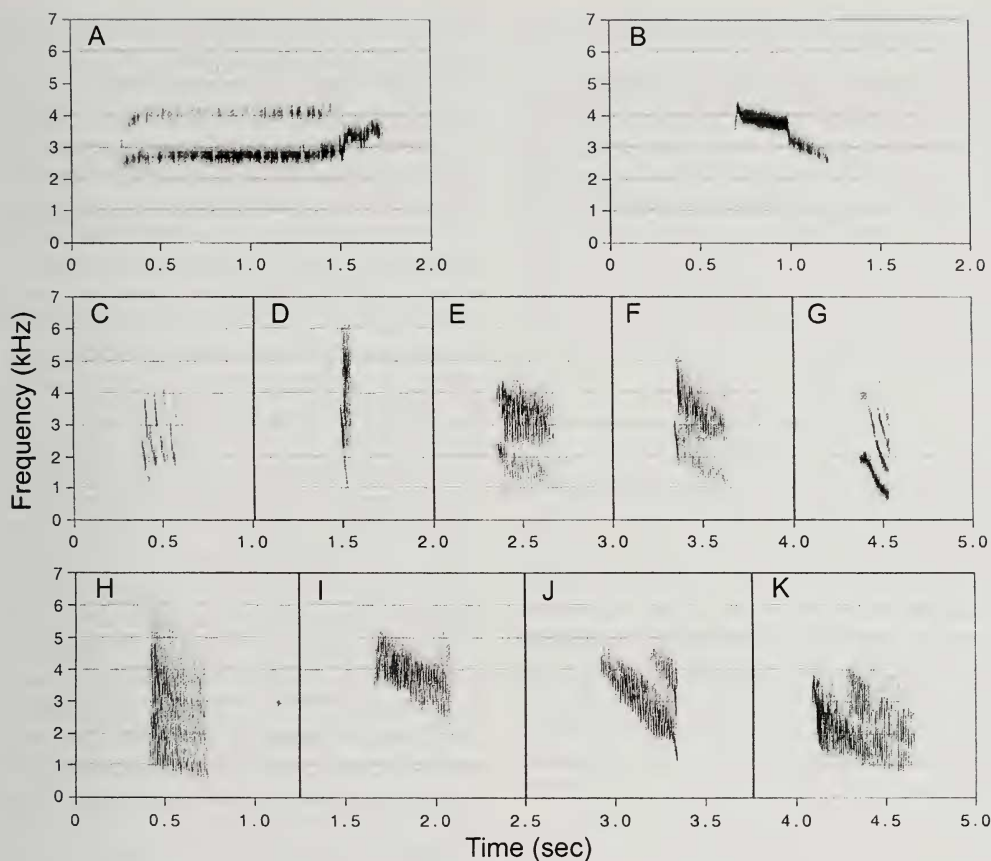


FIG. 2. Sound spectrograms of antbird vocalizations. Unless otherwise noted, all recordings were made by D. F. Lane at our Río Morona locality, Departamento Loreto, Peru, July 2001. (A) “Song” of *Pithys castaneus*. (B) “Song” of *Pithys albifrons* (T. A. Parker, III, and G. F. Budney, from Isler and Whitney 2002). (C) “Chime” of *Pithys castaneus*. (D) “Chit” of *Pithys castaneus*. (E) Agitated “Chirr” of *Pithys castaneus*. (F) “Chit-chirr” of *Pithys castaneus*. (G) “Mew” of *Pithys castaneus* (J. Alvarez A.). (H) “Chirr” of *Pithys castaneus*. (I) “Chirr” of *Pithys albifrons*. (J) “Chirr” of *Gymnopithys leucaspis*. (K) “Chirr” of *Phlegopsis erythroptera*.

izations of agitation, one male (sex confirmed by collection), was observed perched on a horizontal branch at the edge of a treefall gap about 2 m above the ground. This was the highest we ever observed the species to perch, and was likely an agitation response to playback of the song. On one occasion, a distinct, quiet, mewing “eaaah” call was given by two individuals while close to one another; we interpret this as some sort of contact call or “softsong” within the pair (Fig. 2G).

The most common vocalization was a call given by individuals while foraging at ant swarms. This was a deep chirr call (terms following Willis 1967, Zimmer and Isler 2003; Fig. 2H), similar to vocalizations given by most professional ant-following thamnophil-

ids when attending ant swarms, and suspected to be a means of maintaining individual foraging space at the swarm (Willis 1967; M. L. Isler *in litt.*). When the chirr of *P. castaneus* was heard simultaneously with those of most of the other species of professional ant-followers at a swarm, it sounded generally louder, of lower overall frequency, and descended less obviously (see Fig. 2H–2K). Only the chirr call of *Phlegopsis erythroptera* (Fig. 2K) reaches a frequency as low as that of *Pithys castaneus*, but the former can be distinguished easily by a higher, more metallic introductory sound and a more sharply descending component. The chirr call of *Phlegopsis erythroptera* was louder than that of *Pithys castaneus* on occasion, but this appeared to be influ-

enced by emotional state and was not always the case.

Playback experiments using recordings of the suspected song elicited varying reactions from individuals: some responded immediately, giving agitated calls and posing on exposed perches that were higher than typical perches (see above), while others approached silently to investigate. On two occasions, individuals approached only after 2–3 min of playback. Playback of chirr calls resulted in a quiet, curious approach at best.

## DISCUSSION

*Taxonomic status of the species.*—Whereas the generic allocation of *Pithys castaneus* has been considered dubious, we believe that phenotypic characters such as the species' song-like vocalization, its bold chestnut plumage, black hood and white face, and its saffron-yellow legs all suggest a close relationship with *P. albifrons*. Furthermore, R. T. Brumfield and J. G. Tello (unpubl. data) have been building a molecular phylogeny of the *Thamophilidae*, and have found *P. castaneus* and *P. albifrons* to be sister taxa.

*Potential habitat specialization.*—Based on our observations, we suspect that *P. castaneus* is restricted to *varillal* forests. We should note, however, that we observed and mist-netted *P. castaneus* individuals that had followed ant swarms from *varillal* into *varzea* forest immediately adjacent to our campsite, and twice we recorded individuals on richer, hilly *terra firme* forest within 300 m of typical *varillal* habitat. We never encountered Hairy-crested Antbird (*Rhegmatorhina melanosticta*) at the Morona site and wonder whether it may be replaced by the similarly sized *P. castaneus* (see Table 1) in the region or (more likely) habitat. We can find no evidence that *R. melanosticta* inhabits the region between the rios Santiago and Pastaza, but it is quite possible that this is due to poor sampling as it is to true absence. If *R. melanosticta* competitively excludes *P. castaneus* outside the Morona-Pastaza *varillal* forest, this may explain the restricted distribution of the latter species. Furthermore, if *varillal* forest habitat was not included in the searches conducted by Willis and the ANSP expedition along the Pastaza, their failure to encounter the species may be

explained by the possible habitat specialization of *P. castaneus*.

*Potential distribution of Pithys castaneus.*—Landsat imagery, complemented with information from Instituto de Investigaciones de la Amazonía Peruana personnel and local people, shows what we interpret to be fairly large blocks of *varillal* forest embedded within a quadrangle formed by the Río Marañón to the south, the Río Morona to the east, the Río Mayuriaga to the north, and the Cordillera Campanquís to the west. Besides this area, *P. castaneus* populations are likely to occur in similar forest along the Río Pastaza in Loreto and probably into Ecuador. At present, we have no information about the existence of *varillal* forest at the latter sites. However, some indicator species of *varillal* forest have been found along the upper Río Pastaza in Ecuador (e.g., Pompadour Cotinga, *Xipholena punicea*, and Red-fan Parrot, *Derophtus accipitrinus*; Ridgely and Greenfield 2001a), suggesting that the area probably supports *varillal* forest habitat. We suspect that once such forests along the upper Río Pastaza are located and surveyed, the mystery of the true position of the “Andoas” collecting locality finally will be unraveled.

*Conservation.*—The west bank of the Río Morona, including the areas of *varillal* forest where our work was conducted, are part of the recently created Zona Reservada Santiago Comaina, created in 1999. According to Peruvian legislation, its new status is temporary, but supposedly, it will be ranked as a definitive conservation unit in the future (National Park, National Reserve, National Sanctuary, or Communal Reserve). However, local leaders of the Federacion de Comunidades Indígenas del Río Morona informed us that they strongly oppose the creation of a reserve and will fight to prevent this action.

A branch of the North-Peruvian oil pipeline that transports oil from the upper Río Pastaza passes through a large portion of *varillal* forest as it crosses the Río Mayuriaga on its way to the Río Marañón. At present, this has meant the destruction of only a 50-m-wide swath of forest along the pipeline. However, an oil spill could have drastic consequences for this rather delicate habitat, particularly with its flat terrain and poor drainage. Furthermore, the pipeline itself could represent a potential dispersal



barrier for *P. castaneus*. It is also worth mentioning that there are several plans to connect Ecuador's Amazonian road network to the Río Marañón. Anecdotal evidence suggests that many bird species of interior forest understory are averse to crossing large openings or other similar breaks, such as rivers or roads (Zimmer and Isler 2003). Thus, gaps such as those associated with roads and pipelines may pose barriers to gene flow in populations of these understory species.

*Population estimate.*—During our stay we surveyed about 8 km<sup>2</sup> of white-sand forests and encountered between six and eight different army ant swarms of *E. burchelli* and two of *L. praedator*. Based on our extrapolations, we estimate the number of *P. castaneus* to be between 18 and 26 individuals in the area we surveyed. If we consider the immediate area (the Morona-Santiago interfluvium) covered with *varillal*, then the population estimate of *P. castaneus* would be ~1,300–2,500 individuals. Prior to our rediscovery of *P. castaneus*, the species was considered to be rare, with a very restricted global distribution, and probably threatened (Bibby 1992, Stattersfield and Capper 2000). Considering the population estimates and the potential threats presented here, we recommend changing the species' status from Data Deficient to Vulnerable, according to the ranking criteria presented in Stattersfield and Capper (2000). If a road or any other invasive construction project threatens the white-sand forests between the ríos Morona and Santiago, then the species' status should be upgraded to a category of higher risk.

Since our rediscovery of *P. castaneus* in July 2001, and our discovery of the two Treneman specimens in MUSM, we have been informed of two subsequent observations of *P. castaneus* by colleagues who visited our Morona site. Observers visited the site 22–24 June 2002 and 24 May 2003 (M. Levy, J. Nilsson, M. Sokol, and B. Walker pers. comm.). Both parties saw the species, but the 2002 observation was of multiple individuals and the observers regarded the species as “one of the most common birds” at the site. During the 2003 visit, however, only one individual was observed, possibly because swarms of army ants were not easily encountered then (an artifact of the season?).

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## LITERATURE CITED

- ALVAREZ A., J. AND B. M. WHITNEY. 2001. A new *Zimmerius* tyrannulet (Aves: Tyrannidae) from white sand forests of northern Amazonian Peru. *Wilson Bulletin* 113:1–9.
- ALVAREZ A., J. AND B. M. WHITNEY. 2003. New distributional records of birds from white-sand forests of the northern Peruvian Amazon, with implications for biogeography of northern South America. *Condor* 105:552–566.
- ANDERSON, A. B. 1981. White-sand vegetation of Brazilian Amazonia. *Biotropica* 13:199–210.
- BERLIOZ, J. 1938. *Pithys castanea*, sp. nov. *Bulletin of the British Ornithologists' Club* 58:90–91.
- BERLIOZ, J. 1948. Note critique sur le genre *Pithys* Vieillot (Formicariidés). *L'Oiseau et la Revue Française d'Ornithologie* 18:1–4. [in French]
- BIBBY, C. J. 1992. Putting biodiversity on the map: priority areas for conservation. International Council for Bird Preservation, Girton, Cambridge, United Kingdom.
- CHARIF, R. A., S. MITCHELL, AND C. W. CLARK. 1995. Canary I.2. Cornell Laboratory of Ornithology, Ithaca, New York.
- COLLAR, N. J., L. P. GONZAGA, N. KRABBE, A. MADROÑO NIETO, L. J. NARANJO, T. A. PARKER, III, AND D. C. WEGE. 1992. Threatened birds of the Americas: the ICBP/IUCN Red Data Book, 3rd ed., part

2. Smithsonian Institution Press, Washington, D.C.
- DAVID, N. AND M. GOSSELIN. 2002. The grammatical gender of avian genera. *Bulletin of the British Ornithologists' Club* 122:257–282.
- ISLER, M. L., J. ALVAREZ A., P. R. ISLER, AND B. M. WHITNEY. 2001. A new species of *Percnostola* antbird (Passeriformes: Thamnophilidae) from Amazonian Peru, and an analysis of species limits within *Percnostola rufifrons*. *Wilson Bulletin* 113: 164–176.
- ISLER, M. L., P. R. ISLER, AND B. M. WHITNEY. 1998. Use of vocalizations to establish species limits in antbirds (Passeriformes: Thamnophilidae). *Auk* 115:577–590.
- ISLER, P. R. AND B. M. WHITNEY. 2002. Songs of the antbirds: Thamnophilidae, Formicariidae, and Conopophagidae (CD). Library of Natural Sounds, Cornell University, Ithaca, New York.
- PAYNTER, R. A., JR. 1993. *Ornithological gazetteer of Ecuador*. Harvard University Press, Cambridge, Massachusetts.
- RICHARDS, P. W. 1996. *The tropical rainforests: an ecological study*. Cambridge University Press, Cambridge, United Kingdom.
- RIDGELY, R. S. AND P. J. GREENFIELD. 2001a. *The birds of Ecuador: field guide*. Cornell University Press, Ithaca, New York.
- RIDGELY, R. S. AND P. J. GREENFIELD. 2001b. *The birds of Ecuador: status, distribution, and taxonomy*. Cornell University Press, Ithaca, New York.
- RIDGELY, R. S. AND G. TUDOR. 1994. *The birds of South America*. University of Texas Press, Austin.
- RUOKOLAINEN, K. AND H. TUOMISTO. 1993. La vegetación de terrenos no inundables (tierra firme) en la selva baja de la Amazonía peruana. Pages 139–153 in *Amazonía Peruana: vegetación húmeda tropical en el llano subandino* (R. Kalliola, M. Puhakka, and W. Danjoy, Eds.). Amazon Project of the University of Turku, Jyväskylä, Finland.
- RUOKOLAINEN, K. AND H. TUOMISTO. 1998. La vegetación natural de la zona de Iquitos. Pages 253–365 in *Geoecología y desarrollo amazónico. Estudio integrado de la zona de Iquitos, Perú* (R. Kalliola and S. Flores P., Eds.). *Annales Universitatis Turkuensis Series A II*, vol. 114.
- SCHULENBERG, T. S. AND D. F. STOTZ. 1991. The taxonomic status of *Myrmeciza stictothorax* (Todd). *Auk* 108:731–733.
- SIBLEY, C. G. AND B. L. MONROE, JR. 1990. *Distribution and taxonomy of birds of the world*. Yale University Press, New Haven, Connecticut.
- STATTERSFIELD, A. J. AND D. R. CAPPER (EDS.). 2000. *Threatened birds of the world: the official source for birds on the IUCN red list*. BirdLife International, Cambridge, United Kingdom, and Lynx Edicions, Barcelona, Spain.
- STEVENS, L. AND M. A. TRAYLOR, JR. 1983. *Ornithological gazetteer of Peru*. Harvard University Press, Cambridge, Massachusetts.
- WHITNEY, B. M. AND J. ALVAREZ A. 1998. A new *Herpsilochmus* antwren (Aves: Thamnophilidae) from northern Peru and adjacent Ecuador: the role of edaphic heterogeneity of *terra firme* forest. *Auk* 115:559–576.
- WILLIS, E. O. 1967. *The behavior of Bicolored Antbirds*. University of California Publications in Zoology 79:1–132.
- WILLIS, E. O. 1968. Taxonomy and behavior of Pale-faced Antbirds. *Auk* 85:253–264.
- WILLIS, E. O. 1981. Diversity in adversity: the behaviors of two subordinate antbirds. *Archivos de Zoología* 30:159–234.
- WILLIS, E. O. 1984. *Phlegopsis erythroptera* (Gould 1855) and relatives (Aves, Formicariidae) as army ant followers. *Revista Brasileira Zoologia* 2:165–170.
- ZIMMER, K. J. AND M. L. ISLER. 2003. Family Thamnophilidae (typical antbirds). Pages 448–681 in *Handbook of birds of the world, vol. 8: broadbills to tapaculos* (J. del Hoyo, A. Elliott, and D. Christie, Eds.). Lynx Edicions, Barcelona, Spain.